

CLAIMS

1. A method for producing a wafer comprising at least an ingot heat-treating step of subjecting a silicon single crystal in a state of an ingot to heat treatment, and a wafer processing step of processing the heat-treated ingot into wafers.
2. The method for producing a wafer according to Claim 1, wherein in the ingot heat-treating step, bulk micro defects (BMDs) are formed in the silicon single crystal.
3. The method for producing a wafer according to Claim 1 or 2, further comprising a wafer heat-treating step of subjecting the wafers to heat treatment after the wafer processing step.
4. The method for producing a wafer according to any one of Claims 1 to 3, wherein in the wafer processing step, the heat-treated ingot is processed into mirror-like wafers.
5. The method for producing a wafer according to Claim 4, further comprising an epitaxial growth step of forming an epitaxial layer on the wafer after the processing into the mirror-like wafers.

6. The method for producing a wafer according to any one of Claims 1 to 5, wherein in the ingot heat-treating step, the silicon single crystal in a state of an ingot is subjected to heat treatment at 700 °C or more.

7. The method for producing a wafer according to any one of Claims 1 to 6, wherein in the ingot heat-treating step, the heat treatment is performed at a heat treatment temperature of 1100 °C or less for 30 minutes to 8 hours.

8. The method for producing a wafer according to any one of Claims 1 to 7, wherein in the ingot heat-treating step, the heat treatment is performed at a heat treatment temperature of 700 °C to 900 °C for 30 minutes to 8 hours.

9. The method for producing a wafer according to any one of Claims 1 to 8, wherein in the ingot heat-treating step, the heat treatment is performed at a temperature rising rate of 0.5 °C/min to 10 °C/min.

10. The method for producing a wafer according to any one of Claims 1 to 9, wherein in the wafer

heat-treating step, a defect-free region (a DZ (denuded zone) layer) is formed in a surface of the wafer.

11. The method for producing a wafer according to any one of Claims 1 to 10, wherein in the wafer heat-treating step, the heat treatment is performed at a heat treatment temperature of 900 °C to 1300 °C for 5 minutes to 16 hours.

12. The method for producing a wafer according to any one of Claims 1 to 11, wherein in the wafer heat-treating step, the temperature is raised at a temperature rising rate of 5 °C/min or more.

13. The method for producing a wafer according to any one of Claims 5 to 12, wherein the epitaxial growth step is that after a pretreatment is performed at a temperature of 1000 °C or more, the epitaxial growth is performed at a temperature of 1000 °C or more.

14. The method for producing a wafer according to any one of Claims 1 to 13, wherein the silicon single crystal is a crystal doped with nitrogen.

15. The method for producing a wafer according

to any one of Claims 1 to 14, wherein the silicon single crystal is a crystal in a nearly perfect crystal (NPC) region produced by Czochralski method.

16. The method for producing a wafer according to any one of Claims 1 to 15, wherein the silicon single crystal in a state of an ingot is an ingot pulled by a single crystal-pulling apparatus according to Czochralski method as it is or an ingot in a state that the pulled ingot is cylindrically ground and cut in a shape of a block.